

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-197285

(43)Date of publication of application : 31.07.1998

(51)Int.Cl.

G01D 4/00  
B60S 5/00  
G01M 17/007  
G06F 17/60  
G07C 11/00

(21)Application number : 09-001640

(71)Applicant : TSUBASA SYST KK

(22)Date of filing : 08.01.1997

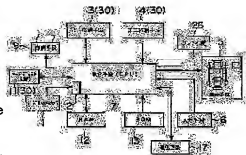
(72)Inventor : SAKAI MICHIMOTO

## (54) SYSTEM FOR ESTIMATING ACCIDENT VEHICLE REPAIR COST

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To rapidly estimate a repair cost by capturing image data of accident vehicle by a digital camera, deciding and sorting damage sites, and calculating to estimate it.

**SOLUTION:** The accident vehicle repair cost estimating system comprises, for example, first and second storage means 3 (30), 4 (30) for storing data of component costs and wages and data of components corresponding to damaged sites of each vehicle model, an estimating means 7 for estimating repair cost based on the data, a capturing means 2 for capturing image photographed by a digital camera 1, and a link means 26 for deciding whether the image data indicates the damage of any site in a vehicle developed view. When the data of the model of the accident vehicle and the image data are input, accident vehicle image and, for example, vehicle developed view are displayed, and the judgement of the damaged site is manually or automatically executed. Calculated result of the means 7 based on the respective data is displayed or printed, and a telephone channel communication can be conducted as well.



## LEGAL STATUS

[Date of request for examination]

08.01.1997

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

2957501

[Date of registration]

23.07.1999

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the system which performs the repair-cost estimate of the car damaged according to accident etc.

[0002]

[Description of the Prior Art] When reconditioning the car damaged according to accident generally, huge time and effort is needed for the estimate of the costs.

[0003] That is, as well as the sheathing part of the collision place of a car, it needs to be distorted by collision, or it is necessary to estimate and examination of the price of a substitute part and wages need to integrate these costs following prediction of the damaged internal components, and a pan.

[0004] For this reason, if it is the accident which is extent in which the bumper was dented, an estimate is also easy, but it is very difficult [ it ] to leak and take up until the components exchanged in accident which deforms to an engine room or wheel alignment, and a process will become huge and it results in a screw nut, and wiring and a coupler as well as assembly components.

[0005] And since they change with types of a car, these estimates have the problem that even start is impossible, if there is no manual book of the type of a car concerned. Moreover, since automobile property damage insurance has spread widely, although the damage by accident is filled up by insurance in many cases, the in this case still more complicated problem has been conceived.

[0006] That is, when the costs are paid by insurance, in order to make disbursement into a necessary minimum thing as an insurance company, it will be necessary to grasp extent and costs of repair to accuracy, although a repair shop should do the above mentioned estimated activity essentially. However, the abundant repair shops of a repair experience, the research institute which has a special judge can evaluate the relation between extent of breakage, and repair cost to accuracy, and it requires considerable information and a considerable experience.

[0007] And to fix by insurance, it is necessary to consider the relation between extent of breakage, and repair cost between a repair shop and an insurance company, and to consider as the objective thing to which both sides are convinced.

[0008]

[Problem(s) to be Solved by the Invention] By the way, although the photograph is performing record of accident, the most difficult work arranges this systematically and it is not avoided that a mistake and an oversight arise.

[0009] Moreover, in a survey while comparing two or more photographs, since huge time and effort is taken upwards and absolute objectivity is missing at assessment of breakage, when using insurance, a check will increase.

[0010] In addition, by the approach of using the conventional photograph, while development took time amount, since it was necessary to distribute a photograph to three persons of a repair shop, a research institute, and an insurance company with a document, by the time it determined the actual estimate from record, also at the lowest, considerable days had started.

[0011] There is a possibility of also spoiling the profit of the owner of an accident vehicle for these reasons, without repair advancing. It was made in order that this invention might solve this conventional trouble, and breakage can be evaluated, and it is in offering the accident vehicle repair-cost estimated system which can be estimated promptly more exactly.

[0012]

[Means for Solving the Problem] The following means were used for this invention in order to solve the technical problem mentioned above. Namely, the accident vehicle repair-cost estimated system of this invention A capture means 2 to incorporate the image data of an accident car as the 1st invention, A storage means 30 to memorize car attribute data required for an accident vehicle repair-cost bid. The input means 16 for inputting estimated data required for an accident vehicle repair-cost bid, The display means 5 for displaying the various data containing accident car image data, A link means 26 to determine which part of a car said image data shows breakage on clearly, While displaying simultaneously the car attribute data of the part corresponding to said image data and said image data on said display means 5, it has an estimated means 7 to perform accident vehicle repair-cost estimated processing based on said estimated data and car attribute data.

[0013] As the 2nd invention, in said 1st invention, said capture means 2 incorporates two or more sorts of image data of an accident car, said link means 26 determines at least each part corresponding to each image data, and said estimated means 7 displays simultaneously each image data and the car attribute data like each part corresponding to each image data on said display means 5 during accident vehicle repair-cost estimated processing.

[0014] As the 3rd invention, it sets to said 1st and 2nd invention. Said storage means 30 Car graphic data are memorized further. Said link means 26 The image data displayed on said display means 5 determines which part in the car graphic form displayed on said display means 5 breakage on is shown clearly. Said estimated means 7 The car attribute data of the part which includes the part graphic form corresponding to said image data and said image data during accident vehicle repair-cost estimated processing is simultaneously displayed on said display means 5.

[0015] As the 4th invention, in said 1st [ the ] - the 3rd invention, if said estimated means 7 pinpoints a part with said input means 16, it elects one or more image data which shows breakage on the pinpointed part clearly, and has the procedure displayed on said display means 5.

[0016] Next, the important component of this invention is explained further.

[Capture means 2] It is I/O for transmitting the image data of the accident car photoed in the digital camera 1 grade to the estimated means 7 (processor). As this I/O (input means), an infrared receiving set, a modem, flexible disk equipment, etc. can be illustrated.

[0017] Here, in the digital camera 1, it has the charge-coupled device (CCD:CHAGED COUPLED DEVICE) and the lens for carrying out image formation of the image to this CCD, and the image which carried out image formation is accumulated in digital memory, and it has a means to output this data outside. This output means is for example, an infrared sending set, a modem, flexible disk equipment, etc.

[0018] Furthermore, the function which adds a mark to the arbitration location in the photoed image can be given to this digital camera 1. In this case, assignment of a breakage location and breakage extent can be marked, looking at a real vehicle immediately after photoing the image of a site. Moreover, if communication facility is given, it is also possible to transmit the image and data with a cellular phone or PHS (personal handyphone system). Moreover, you may make it store data, such as a number of a car, and a type, in a digital camera 1 with image data.

[0019] In addition, although the image data photoed and obtained in a digital still camera is suitable for car image data, it may be a digital camcorder and digital image data obtained by scanning a film.

[Storage means 30] Although the thing of what kind of format may be used as long as the storage means 30 is a data file in short and it is a storage, it is desirable for easy media to update new data, for example, CD-ROM (compactdisk-read only memory) and MO (magneto optical disk) are suitable. Moreover, to the news flash of new car information etc., the activity of a floppy disk etc. is also possible.

[0020] In addition, the storage means 30 can be constituted from a 1st storing means 3, a 2nd storing means 4, and the storage section 11, the data constellation of the wages which exchange or repair of the components price of a car and the components concerned takes can be stored in the 1st storing means 3, and associated data with the components for which exchange or repair is needed in connection with the breakage part and breakage part of a car can be stored in the 2nd storing means 4. And the storage section 11 can be used for example, as hard disk memory, and can make the fixed form car graphic data of the development view of a car, and a part drawing memorize.

[Display means 5] The display means 5 displays an image for CRT (cathode ray tube), a liquid crystal panel, etc., and the touch sensor may be formed in the front face.

[Input means 6] A keyboard, a mouse, etc. can be illustrated as an input means 6.

[Link means 26] The link means 26 compares the car graphic form which it has beforehand in fixed form with the accident car image and the storage section 11 which are displayed on the display means 5, and it distinguishes and classifies [ of the accident car image photoed several many sheets ] which part in a car graphic form is shown clearly, respectively. Which approach of manual processing or automatic processing in which the keyboard and the mouse were used may be used for it, and this classifying is good to make it make the number which specifies the image data corresponding to the data file created for every each part grade memorize while it makes a name, a number, etc. which pinpoint a part in each data file of a database which memorizes accident car image data memorize.

[Estimated means 7] The estimated means 7 is an arithmetic unit which performs repair-cost estimated processing based on each data actually, and consists of a CPU (central processing unit), RAM (random access memory), a ROM (read only memory), etc.

[0021] And said estimated means 7 may have the communication facility for transmitting and receiving data to the exterior. Thus, by the constituted accident vehicle repair-cost estimated system, in performing a bid of an accident vehicle actually, it displays the image data of a digital camera 1 on the display means 5 through the capture means 2 first. On the other hand, from the storage section 11, the fixed form car graphic form of the development view of a car and a part drawing is outputted to the display means 5. Here, the image data currently displayed judges which part in a development view or a part drawing it is a thing applicable to with a manual or automatic. Thereby, each image data becomes clear [ the breakage on what is shown ]. All image data is distinguished similarly and the part classification is assigned to each image data.

[0022] And since each image is simultaneously displayed at least on each part by the display means 5 when estimating with the estimated means 7, the estimate which can be set at least to each part can be performed correctly and promptly, checking a suitable accident car image by looking.

[0023] make a breakage part actual when making it carry out automatically to a repair cost estimate furthermore contrast with a car graphic form , and it continue , and it collate with the data in which the breakage part and the breakage extent which became clear with the link means 26 be stored by the 1st and 2nd storing means 3 and 4 , and it enumerate and an estimated means 7 display on a display means 5 the list of the components which require exchange or repair , and the list of wages . Although the list of this component and wages is displayed on the display means 5 for every each part grade, since image data [ / in that case ] is simultaneously displayed at least on each part by the display means 5, it can make a check and correction of a list easily.

[0024] in addition, wages -- not only the wages of a parts replacement but a fender -- beginning to beat -- \*\* -- of course, it is a concept also containing charges of a technique, such as correction [ like ] and welding In addition, an indicative data is printed out if needed. Moreover, an indicative data can also be stored in a server or external memory.

[0025] In addition, vocabulary called a part expresses the group of components with a certain amount of settlement related to the components of 1 of a car. A certain amount of settlement may be the group of the components close to the components of 1, or may be a group (for example, group containing the components for which desorption is needed in case the components of 1 are fixed) of components who is related in case the components of 1 are fixed. In addition, the components of 1 are carried out and it is good also as a part of 1.

[0026] [Embodiment of the Invention] Hereafter, the accident vehicle repair-cost estimated system of this invention is further explained to a detail about the operation gestalt shown in drawing 1 - drawing 10 .

[0027] Drawing 1 shows the block diagram of the accident vehicle repair-cost estimated system of this invention. This serves as the same appearance as a personal computer so that it can be used in the administration building of a car garage etc.

[0028] The 2nd storing means 4 (30) which stored the associated data of the 1st storing means 3 (30) which stored the data constellation of the wages which the components price of a car and a parts replacement, or repair concerned takes, and the breakage part of the car accompanying accident and the components for which exchange or repair is needed with breakage is formed in the interior of the body of equipment. As these 1st storing means 3 and the 2nd storing means 4 are shown in drawing 7 , it memorizes in CD-ROM10 and each data of the 1st storing means 3 and the 2nd storing means 4 is memorized about .. C vehicles B vehicles A vehicles, respectively.

[0029] Although the appearance of components, a price, and wages are shown in the data of the 1st storing

means 3, these wages are expressed with the lever rate, for example, the difficulty of 0.5 and an activity has become A with a comparatively low lever rate in exchange of a bumper. And actual wages multiply 0.5 of this lever rate by 10000 of a criteria price, and are 5000 yen (refer to drawing 9 ).

[0030] In the lever rate of door exchange, the difficulty of 0.75 and an activity is B of whenever [ middle ] similarly. And actual wages multiply 0.75 of this lever rate by 10000 of a criteria price, and are 7500 yen. 10000 of a criteria price is a certified value, is slid to prices etc. and gone up and down. That is, the lever rate is determined by the difficulty of an activity, working hours or the operating frequency of a special tool, etc.

[0031] The CD-ROM drive (not shown) of the body of equipment can be equipped with said CD-ROM10, and it can carry out conversion now easily. This is because it is always necessary to use the newest data with sale of a new car.

[0032] Moreover, the display means (display) 5 for displaying various data, such as car graphic data, is formed in the body of equipment. This display means 5 is driven with the estimated means (CPU) 7, and various graphic forms and an alphabetic character are displayed. The hard disk drive as the storage section 11, RAM12, and ROM13 that stored the executive program are connected to said estimated means 7, and required OS (operation system) makes it have memorized beforehand.

[0033] The car graphic form 25 is beforehand memorized by said storage section 11. As shown in drawing 8 , this car graphic form 25 is the graphic form which developed the car, and is displayed on the display means 5 like a graphic display. In addition, the car graphic form displayed on the display means 5 may be 6th page drawing of a car etc.

[0034] Moreover, even if the car graphic form 25 makes the hard disk drive memorize a single graphic form, it makes several sorts of graphic forms, such as a passenger car, and a wagon vehicle, a truck, memorize, and may enable it to choose a graphic form according to an accident vehicle. Furthermore, the detail is made to memorize the car graphic form for every (A vehicle, B vehicle, C vehicle ..\*\*) type of a car to said CD-ROM10 further, and the graphic form which suited in each type of a car may be made to be displayed on it by the display means 5.

[0035] The image 50 photoed with the digital camera 1 other than the car graphic form 25 is displayed on said display means 5. A digital camera 1 photos an accident car and is incorporated through the capture means 2 connected to said estimated means 7. and Icons 5e-5h display on the display means 5 -- having -- \*\*\*\* -- extent of the damage to 5e, and 5f -- a model, a type of a car, and 5g -- a under carriage -- an insurance company is inputted into a number and 5h from a keyboard (input means) 6.

[0036] In addition, although the estimated means 7 contains CPU, I/O, etc., the link means 26 is connected to this I/O. In addition, by actual hardware, the estimated means 7 and the link means 26 may be united.

[0037] The link means 26 is for the image data of the accident car photoed at various include angles to determine which part in the car graphic form 25 breakage on is shown clearly.

[0038] This link means 26 is explained based on drawing 2 - drawing 6 . Drawing 2 - drawing 5 express four in the image which photoed the accident car with which car anterior part collided. That is, drawing 2 photos a car from the slanting front, drawing 3 is photoed from a left lateral, drawing 4 is photoed from a transverse plane, and drawing 5 photos a car from the upper part. Here, what photoed the part which is not related to breakage is excepted.

[0039] Since there is a common feature at the point which the same part (a front grille, bumper) has damaged, these four sheets are altogether memorized as "an image in which it is shown that the left anterior part of a car is damaged." That is, a "front grille" or a part name with a "bumper" is memorized by the each images [ 50a-50d ] data file expressed to drawing 2 - drawing 5 among the databases which memorize accident car image data, respectively. Moreover, the part name of a "left-hand side front door" is also memorized by image 50b and the data file of 50d of images, respectively.

[0040] for this reason -- for example, these images can also be displayed on the display means 5 by devoting oneself with a "front grille" or a "bumper" by the keyboard, and the image corresponding to these can also be displayed now on the display means 5 by clicking the anterior part (5a, 5b) of the car graphic form 25 with a mouse. In addition, if breakage partial 5c of the door in drawing 8 is clicked, the images 5b and 5d shown in drawing 3 and drawing 5 will be displayed on the display means 5. When there is two or more image data only corresponding to each part, you may make it display two or more images simultaneously on the screen of the display means 5, or may make it display one image data at a time here.

[0041] Thus, as shown in drawing 6 , when it is simultaneously displayed on the display means 5 and estimated

processing is performed, the exact assessment of a breakage part of the car graphic form 25 and an image 50 is attained. For displaying extent of breakage at this time, as shown in drawing 8, Circles 5a, 5b, and 5c are drawn with the input means 6 at breakage, and you may make it express with the area of that circle, and may make it make it display by the rank of a notation, for example, ABC.

[0042] The estimated means 7 collates with the data in which the breakage part and breakage extent which became clear with the input means 6 and the link means 26 were stored by the 1st and 2nd storing means 3 and 4, and the list of components which require exchange or repair (15), and the list (16) of wages enumerate and display on the display means 5 for every each part grade after this activity (drawing 9). This collating collates the comparison data of the appearance-damage and internal damage in the type of a car concerned which the 2nd storing means 4 was made to memorize with the specified content. Here, since the car image which corresponds for every list of [ like each part ] is displayed on the display means 5, the displayed check of the list of components or wages can be performed easily, and a repair part, an oversight of repair, etc. can be prevented easily. In addition, an estimated result is printed out by the printing means 9 connected to the estimated means 7.

[0043] At this time, various activities which attach in case a certain specific components are exchanged are also integrated automatically. For example, since the side face of a fender was dented, when carrying out exchange of this, attachment and detachment of the circumference of electrical and electric equipment, such as desorption of a bumper and a light, are indispensable. Therefore, these whole activities serve as wages. Moreover, although it is very difficult to have involved such relation between components intricately, to leak by the conventional approach, and to grasp that there is nothing in a chassis or axle part, it is taken into consideration in this invention by the relation between components, and proper calculation of wages is possible.

[0044] If it explains based on the flow chart which shows a series of above actuation to drawing 10, the type of a car of an accident vehicle, a type, the data of a car number, etc. will be first inputted with the input means 6 (step 101). And two or more image data of the accident car photoed with the digital camera 1 is inputted into the estimated means 7 through the capture means 2 (step 102).

[0045] Then, each image and a car graphic form are displayed on the display means 5, and it is determined whether each inputted image has relation in which part (part) of the car graphic form 25 (step 103). The manual processing which an operator performs is sufficient as decision of this step 103, and CPU compares the normal visible outline of the car concerned beforehand remembered to be the visible outline of the car on image data, and it may be made to perform it automatically.

[0046] And the estimated means 7 performs estimated processing based on each data (step 104). In this step 104, while the car attribute data like each image data determined at said step 103 and each part is simultaneously displayed on the display means 5, estimated processing is performed. That is, at step 104, collating of need components is performed and the list of components required for repair is obtained from breakage extent in each breakage part. And each price of a components group and each wages are computed. As this result shows drawing 9, it is displayed on the display means 5.

[0047] Thus, with the printing means 9, the obtained estimated result can be printed out in the form with which it opted for the format beforehand, and makes this delivery examination data at required engines, such as an insurance company. Moreover, since the obtained data can also be directly sent through the communication lines 17, such as the telephone line, a calculation result etc. can be examined promptly.

[0048]

[Effect of the Invention] Since linking of the image data of an accident car is carried out to a car part and it enabled it to display these simultaneously during estimated processing according to this invention, extent of breakage can be grasped to accuracy and a check and correction of a repair part or wages can be made easily. For this reason, a quick and suitable repair-cost estimate is attained.

[0049] Moreover, since each accident car image only corresponding to each part can be displayed simultaneously, a bid can be performed more to accuracy. Moreover, since the car graphic form was used for pinpointing a part, pinpointing of a part is easy and can perform estimated processing efficiently.

[0050] Furthermore, since two or more car images can be simultaneously displayed to the part of 1, a bid can be performed more to accuracy.

\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] A capture means to incorporate the image data of an accident car, and a storage means to memorize car attribute data required for an accident vehicle repair-cost bid, The input means for inputting estimated data required for an accident vehicle repair-cost bid, The display means for displaying the various data containing accident car image data, A link means to determine which part of a car said image data shows breakage on clearly, The accident vehicle repair-cost estimated system characterized by having an estimated means to perform accident vehicle repair-cost estimated processing based on said estimated data and car attribute data while displaying simultaneously the car attribute data of the part corresponding to said image data and said image data on said display means.

[Claim 2] Said capture means is an accident vehicle repair-cost estimated system according to claim 1 which two or more sorts of image data of an accident car is incorporated, and said link means determines at least each part corresponding to each image data, and is characterized by said estimated means displaying simultaneously each image data and the car attribute data like each part corresponding to each image data during accident vehicle repair-cost estimated processing at said display means.

[Claim 3] Said storage means memorizes car graphic data further. Said link means The image data displayed on said display means determines which part in the car graphic form displayed on said display means breakage on is shown clearly. Said estimated means An accident vehicle repair-cost estimated system given in either of claims 1 or 2 characterized by displaying simultaneously the car attribute data of the part which includes the part graphic form corresponding to said image data and said image data during accident vehicle repair-cost estimated processing on said display means.

[Claim 4] Said estimated means is an accident vehicle repair-cost estimated system according to claim 1 to 3 characterized by electing one or more image data which shows breakage on the pinpointed part clearly, and having the procedure displayed on said display means, when a part is pinpointed with said input means.

---

[Translation done.]

\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

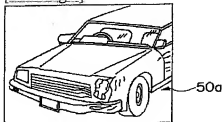
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

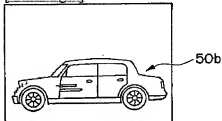
DRAWINGS

---

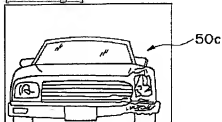
[Drawing 2]



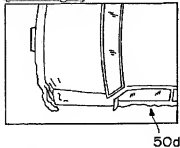
[Drawing 3]



[Drawing 4]

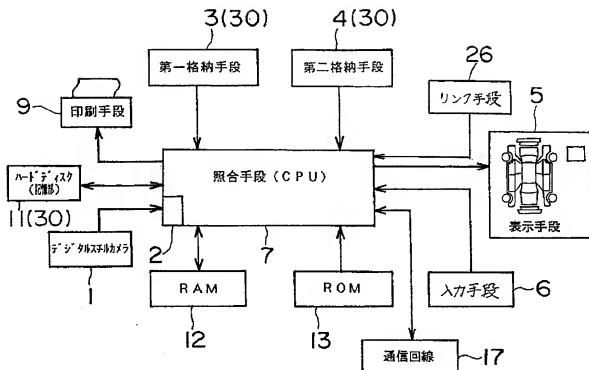


[Drawing 5]

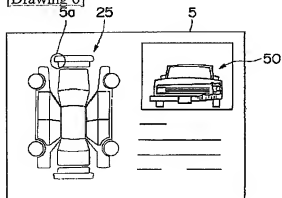


[Drawing 1]





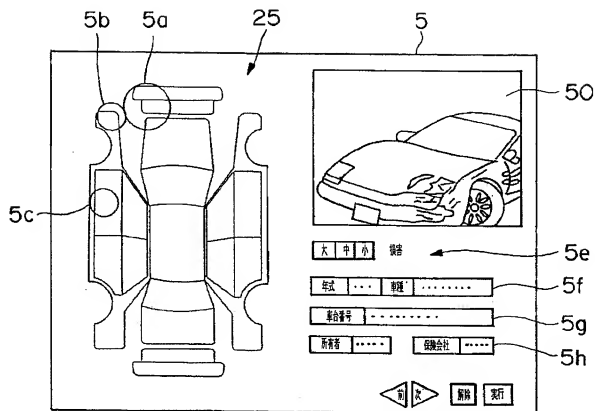
[Drawing 6]



[Drawing 7]

A車	B車	C車	D車	10
第一格納手段	第一格納手段	第一格納手段	第一格納手段	
第二格納手段	第二格納手段	第二格納手段	第二格納手段	
...	...	...	...	

[Drawing 8]

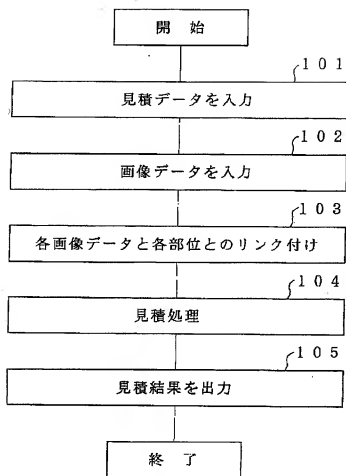


[Drawing 9]

バンパー交換	
0.5A	5,000
ドア交換	
0.75B	7,500
シリンダ交換	
3,00E	30,000

左ドア Assy	57,000
モーター	2,000
*	
*	

[Drawing 10]



---

[Translation done.]